

RESEARCH ABSTRACT

Title of Project: Effects of Environmental Tobacco Smoke on Susceptibility of Mice to Respiratory Infections

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ABSTRACT: In the space below, please provide a descriptive summary of your proposed research project.

Results of epidemiologic studies suggest that exposure to environmental tobacco smoke (ETS) can increase the incidence and severity of infectious respiratory diseases, especially in children. However, these results are not consistent from study to study and are subject to a variety of potential confounding variables. In studies now in progress under a current CIAR contract, we have established methods for exposing mice to simulated ETS and assessing effects of ETS exposure on expression of Sendai virus and *Mycoplasma pulmonis* disease in young adult mice by quantifying numbers of the respective agents and by analysis of lesions by scoring and computerized morphometry. Results to date indicate that chronic, pre-infection exposure of young adult mice to ETS results in increased numbers of *M. pulmonis* organisms in the lungs within 7 days after inoculation. Experiments to meet one objective of the proposed work will be a direct continuation of the current project. Young adult mice will be exposed to ETS for 8 weeks before aerosol inoculation with *M. pulmonis* and studied for intervals of up to 3 months after inoculation to determine whether exacerbation of acute disease leads to increased severity of chronic lung disease and whether continued ETS exposure potentiates any such effect. We also use will an established method of aerosol inoculation with radiolabelled *M. pulmonis* to assess effects of chronic ETS exposure on intrapulmonary killing and physical removal of *M. pulmonis* from the lungs, as these are the most likely mechanisms by which ETS exposure could lead to increased numbers of organisms in the lungs at short intervals after infection. Additional questions concerning association of tobacco smoke exposure with increased respiratory disease in children are whether such associations are due to in utero effects of maternal smoking or ETS exposure or to postnatal exposure of the child to ETS. Similar methods will be used to meet the remaining objectives of the proposed work, which will be to assess effects of ETS exposure of female mice before and during gestation on susceptibility of their offspring to *M. pulmonis* and Sendai virus; to determine whether exposure of neonatal mice to ETS increases susceptibility of suckling and adolescent mice; and to test whether prenatal and postnatal exposure act synergistically.

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